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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

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ART UNIT	PAPER NUMBER
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2121

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/719,470	Applicant(s) LI ET AL.	
	Examiner Ronald E. Williams	Art Unit 2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is responsive to application filed on November 21, 2003.
2. Claims 1-19 have been examined.

Claim Objections

Claim 6 is objected to because of the following informalities: the phrase "are further to enable" is unclear, thus claim 6 appears to be incomplete. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Boros et al. (**USPN: 6,615,024**).

Regarding Claim 1:

An apparatus, comprising:

A first electronic device (**see Figure 1, element 101-Base Station**) adapted to perform

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a training phase (**see col. 13, lines 4-10**) with multiple second electronic devices (**Figure 1, element 105-Antenna array**) to calculate parameters to enable substantially simultaneous spatial division multiple access transmissions to multiple ones of the multiple second electronic devices; (**see col. 1, lines 54-62**)
a data phase by using the parameters to perform the spatial division access transmissions; (**see col. 2, lines 26-29**)

Regarding Claim 3:

The apparatus of claim 1, wherein the first electronic device is further adapted to perform the data phase by:

transmitting substantially simultaneous data polls to the multiple ones of the multiple second electronic devices through multiple antennas; (**see Figure 10**) and
receiving substantially simultaneous data responses from the multiple ones of the multiple second electronic devices through multiple antennas. (**see Figure 9**)

Regarding Claim 4:

The apparatus of claim 1, wherein the first electronic device is further adapted to perform the training phase by:

transmitting training polls to the multiple second electronic devices; (**see Figure 10**)
receiving training responses from the multiple second electronic devices through multiple antennas; (**see Figure 9**)

processing the training responses received through the multiple antennas; **(see col. 13, lines 34-38)** and calculating the parameters based on the processed training responses. **(see col. 13, lines 34-38)**

Regarding Claim 5:

The apparatus of claim 1, wherein the parameters comprise beam forming parameters. **(see col 12, lines 63 to col 13 line 3 and col 13, lines 30-34)**

Regarding Claim 6:

The apparatus of claim 1, wherein the parameters are further to enable substantially simultaneous spatial division multiple access receptions from the multiple ones of the multiple second electronic devices. **(see col. 1, lines 54-62)**

Regarding Claim 7:

The apparatus of claim 1, wherein the first electronic device further comprises at least four antennas to communicate with the multiple second electronic devices during the training phase and the data phase. **(see col. 13, lines 50-52)**

Regarding Claim 8:

The apparatus of claim 7, wherein the first electronic device further comprises a computing platform coupled to the at least four antennas. **(see Figure 1, element 117-**

Transmit Weight Generator and col. 13, lines 37-38)

Regarding Claim 9:

The apparatus of claim 8, wherein the first electronic device further comprises at least four modulator/demodulators with at least one modulator/demodulator coupled between each of the at least four antennas and the computing platform. **(see col. 3, lines 37-45. “and analog-to-digital converter (“ADC”) if processing is digital.” The analog-to-digital converter disclosed by Boros et al. is the modulator/demodulator claimed by the applicant.)**

Regarding Claim 10:

The apparatus of claim 9, wherein the first electronic device further comprises multiple analog-to-digital converters and multiple digital-to-analog converters with at least one analog-to-digital converter and at least one digital-to-analog converter coupled between each modulator/demodulator and the computing platform. **(see col. 3, lines 37-45)**

Regarding Claim 11:

A method, comprising:

transmitting a training poll to a first mobile device; **(see Figure 10)**

receiving a training response from the first mobile device; **(see Figure 9)**

transmitting a training poll to a second mobile device; **(see Figure 10)**

receiving a training response from the second mobile device; **(see Figure 9)**

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calculating parameters based on the received training response from the first mobile device and the received training response from the second mobile device; **(see col. 13, lines 34-38)** and using the parameters to enable spatial division multiple access transmissions to the first and second mobile devices. **(see col. 2, lines 26-29)**

Regarding Claim 12:

The method of claim 11, wherein said using comprises:

transmitting a first data poll to the first mobile device and a second data poll to the second mobile device substantially simultaneously using spatial division multiple access techniques; **(see Figure 10)** and

receiving a response to the first data poll from the first mobile device and a response to the second data poll from the second mobile device substantially simultaneously. **(see Figure 9)**

Regarding Claim 14:

The method of claim 13, wherein said calculating the parameters comprises calculating beam forming parameters. **(see col. 12, lines 63 to col. 13, line 3 and col. 13, lines 30-34)**

Regarding Claim 15:

The method of claim 13, wherein the parameters are further used to enable spatial division multiple access receptions from the first and second mobile devices. **(see col.**

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1, lines 54-62)

Regarding Claim 16:

A machine-readable medium that provides instructions, which when executed by a processing platform, cause said processing platform to perform operations comprising:

- transmitting a training poll to a first device; **(see Figure 10)**
- receiving a training response from the first device; **(see Figure 9)**
- transmitting a training poll to a second device; **(see Figure 10)**
- receiving a training response from the second device; **(see Figure 9)**
- calculating parameters based on the received training response from the first device and the received training response from the second device; **(see col. 13, lines 34-38)**
- and using the parameters to enable substantially simultaneous transmissions to the first and second devices using spatial division multiple access techniques. **(see col. 2, lines 26-29)**

Regarding Claim 17:

The medium of claim 16, wherein said operations further comprise:

- using the parameters to enable transmitting a data poll to the first device and a data poll to the second device substantially simultaneously using the spatial division multiple access techniques; **(see Figure 10 and col. 2, lines 26-29)**
- and using the parameters to enable receiving a data response from the first device and a data response from the second device substantially simultaneously using the spatial

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division multiple access techniques. (see Figure 9 and col. 2, lines 26-29)

Regarding Claim 19:

The medium of claim 16, further comprising using the parameters to enable substantially simultaneous receptions from the first and second devices using the spatial division multiple access techniques. (see col. 1, lines 54-62) .

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 13, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boros et al. in view of Ren Tianmin (IEEE: Efficient Media Access Protocols for Wireless LANs with Smart Antennas, 2003)

Boros fails to disclose an apparatus wherein the first electronic device is further adapted to perform an acknowledgement phase by using the parameters to perform substantially simultaneous spatial division multiple access transmissions of acknowledgements to the multiple ones of the second electronic devices subsequent to the data phase.

Tianmin discloses a wireless network that utilizes smart antennas and the SDMA protocol. In addition Tianmin teaches an an apparatus wherein the first electronic device

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is further adapted to perform an acknowledgement phase by using the parameters to perform substantially simultaneous spatial division multiple access transmissions of acknowledgements to the multiple ones of the second electronic devices subsequent to the data phase. **(see pg 1288, B. Contention-based polling with directed transmissions, col. 1, lines 9-18 to col. 2, lines 1-21)**

It would be obvious to one of ordinary skill in the arts at the time of invention to modify the invention taught by Boros et al. to include the acknowledgement phase taught by Tianmin et al. providing better communication between base stations and users.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronald E. Williams whose telephone number is 571 272 2590. The examiner can normally be reached on MWF 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571 272 3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Anthony Knight', is positioned above the printed name and title.

Anthony Knight
Supervising Patent Examiner
Tech Center 2100

RW